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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,825	02/11/2004	Mark E. Cook	960296.00097	5721

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EXAMINER

GUPTA, ANISH

ART UNIT	PAPER NUMBER
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1654

NOTIFICATION DATE	DELIVERY MODE
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09/26/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pat-dept@quarles.com

Office Action Summary	Application No. 10/777,825	Applicant(s) COOK ET AL.	
	Examiner Anish Gupta	Art Unit 1654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-7, 12-14, 16-20 and 24-35 is/are pending in the application.
 4a) Of the above claim(s) 4, 27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 2-3, 5-7, 12-14, 16-20, 24-26 and 29-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicants amendment, filed 7-2-07, is acknowledged. Claims 2, 4, 6, 14, 17, 20 were amended, claims 1, 9-11, 15 and 21-22 were canceled, and claims 24-35 were added. Claims 2-7, 12-14, 16-20 and 24-35 are pending in this application. Applicant's election with traverse of Group I, in the reply filed on 11-8-06 is acknowledged.

Election/Restrictions

2. Applicants elected the species Trehalose and anti-PLA2. Claims 2-3, 5-23 read on the elected species. In course of searching, prior art was found that anticipated other species, this has been applied below. Claim 4 and 27-28 has been withdrawn as corresponding to non-elected species. Thus, claims 2-3, 5-7, 12-14, 16-20, 24-26 and 29-35 have been examined.

Withdrawn Rejections

3. Claims 1-3, 5-7, 9-10, 13, 14-17 and 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Andya is hereby withdrawn in view of Applicants amendments.

Maintained Rejections

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 2-3, 5-7, 14-17 and 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Draber et al. (J. Of Immunogical methods).

The claims are drawn to a method for heat stabilizing a specific binding activity of a protein by subjecting the protein to a saccharide.

The reference teaches the stabilization of antibodies using trehalose. The reference specifically teaches a method where the ascetic fluids or purified mAbs were freeze dreid in the presence of trehalose (see page 38). This meets the limitation of claims 1-3 and 5-7. The trehalose freeze dried preparation of IgG and IgM were found to be more stable (see page 41).

Response To Arguments

Applicants argue that the reference does not teach treating the composition with steam at a binding-activiy-destroying temperature. Thus the reference does not anticipate the claims.

Applicants arguments have been fully considered but have not been found persuasive. Applicant arguments imply that the temperature of "steam" is beyond 50°C. However, the instant specification does not provide a specific definition of steam or high temperature. Using a dictionary definition, steam is defined as the hot vapour into which water is converted when heated, which condenses in the air into a mist of minute water droplets (see Askoxford.com). Steam is also defined as a vapor arising from a heated substance the invisible vapor into which water is converted when heated to the boiling point b : the mist formed by the condensation on cooling of water vapor (see Merriam-Webster's). Given these definitions, the art still reads on the claimed invention.

The reference states that the spray dried formulations were stored for upto 1 year at temperatures of 5, 30 and 40°C in chambers equilibrated with saturated lithium chloride and calcium chloride. Saturated CaCl₂ maintained about 38% RH environment with storage of 5°C and about

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23% RH environment with storage of 30 and 40oC (see page 331). Given that the prior art teaches a temperature of 40oC, which can be defined as a high temperature, and there is water vapor in the environment, one could conclude that the composition of Draber is subject to steam.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 2-3, 5-23 remain and new claims 24-26 and 29, 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cook et al. (US6213930) in view of Draber et al. and Andya et al.

The claims are drawn to a method for heat stabilizing a specific binding activity of a protein by subjecting the protein to a saccharide.

The reference of Cook et al. the use of anti-phospholipids A2 antibodies to enhance growth or improve animal feed (see abstract). The reference states a producer animal is immunized with a

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peptide or protein, such as PLA.sub.2, against which antibodies are desired so that the producer animal produces an antibody to said peptide or protein. A substance containing the antibody is obtained from said producer animal. The antibody can be subject to further purification if desired or can be used without further preparation in an animal feed (see col. 3, lines 63-67). Further, An egg preparation, e.g., egg yolks or whole eggs, containing the anti-PLA.sub.2 antibody can be collected and homogenized to form an emulsion. Thereby meeting the imitation of claim 7-12. The resulting emulsion can be dried to form a powder containing the anti-PLA2 antibody. This powder can then be formulated in a manner appropriate to the administration route and then administered to the desired animals using methods known in the art. The preparation is preferably administered orally, most preferably as a supplement to the animal's diet. (see col. 4, lines 14-22). The difference between the prior art and the instant application is that the reference does not teach the use of trehalose.

However, Draber et al. teach the stabilization of antibodies using trehalose. The reference specifically teaches a method where the ascetic fluids or purified mAbs were freeze dreid in the presence of trehalose (see page 38). Trehalose provides effective stabilization during freeze-drying of IgM and such preparations can be stored at elevated temperatures (see page 41). The trehalose freeze dried preparation of IgG and IgM were found to be more stable (see page 41). Trehalose confers unique thermostability to biomolecules including liposome-hemoglobin, air-dried antibodies (see page 41).

The reference of Andya et al. teach that anti-IgE monoclonal antibody during spray drying resulted in a stabilized antibody product and a in decrease rates of aggregation when trehalose was utilized (see page 355).

Therefore, it would have been obvious to one of ordinary skill in the art to use trehalose with anti-PLA.sub.2 antibody because trehalose confers thermostability to dried formulations.

Response to Arguments

Applicants argue that the references combined to not establish a *prima facie* case of obviousness. Specifically Applicants argue that Draber, while showing the activity of the antibody is protected in the dried mixture when stored at 50oC for 14 days, nor Andy disclose a subsequent step of exposing dried mixture to high temperature. “Nothing in Draber suggest, either explicitly or implicitly, that the activity of the antibody in the dried mixture can still be protected if steam is present along with high temperature given that trehalose can be dissolved under such conditions and thereby destroying the protective structure formed between trehalose and the antibody that protects the antibody binding activity.” Similar is true of Andya which does not disclose subsequent exposing the dried mixture to high temperature.

For new claims 24-45 Applicants argue that egg recited in the new claims contains high level of fat. It is not obvious and is counterintuitive to include a high level of fat in the mixture because fat would transmit heat rapidly and thus defeat the purpose of protecting the antibody from thermal stress.

Applicants arguments have been fully considered but have not been found persuasive.

Applicant arguments imply that the temperature of “steam” is beyond 50°C. However, the instant specification does not provide a specific definition of steam or high temperature. Using a dictionary definition, steam is defined as the hot vapour into which water is converted when heated, which condenses in the air into a mist of minute water droplets (see Askoxford.com). Steam is also defined as a vapor arising from a heated substance the invisible vapor into which water is converted

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when heated to the boiling point b : the mist formed by the condensation on cooling of water vapor (see Merriam-Webster's). Given these definitions, the art still reads on the claimed invention.

The reference states that the spray dried formulations were stored for upto 1 year at temperatures of 5, 30 and 40°C in chambers equilibrated with saturated lithium chloride and calcium chloride. Saturated CaCl₂ maintained about 38% RH environment with storage of 5°C and about 23% RH environment with storage of 30 and 40oC (see page 331). It would have been obvious store the composition of Cook at a temperature of up to 50oC. Applicants acknowledge this point. If one did store the dried powder formulation to 50oC, one would achieve the "steam" step and the "high temperature" step because at a temperature of 40o above ambient, water would steam.

Applicants also make reference to fat. However the temperature encompassed by the claims include any temperature above ambient and beyond. The temperature at which fat would interfere the stability is well beyond the minimum temperature encompassed by the claims. A temperature of 35oC can be deemed high, since the antibody can lose activity. At this temperature, the fat would not interfere with the stability and thus the arguments would be moot.

Rejection is maintained.

New Grounds of Rejection

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims 2-3, 5-7, 12-14, 16-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 24 states that the solid composition is exposed to steam at a binding-activity-destroying temperature. It is unclear as to what the steam is composed of. Is the steam, the steam of water, solvent or some other solution. Further, steam is dependant upon many factors including external temperature. If room temperature is well below freezing and the solid is exposed to water with a temperature 25°C, the water will "steam." It is unclear if this is within the definition of "steam."

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 2-3, 5-8, 12-14, 16-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Peebles et al. (US2950204).

The claims are drawn to a method for heat stabilizing a specific binding activity of a protein by subjecting the protein to a saccharide.

The reference teaches a method of making dried egg products that are suitable in cake mixes. The reference specifically teaches that raw egg white was spray dried to form a good edible dry powdered product. This powdered egg white was then mixed with an equal quantity (by weight) of lactose powder. Note that lactose powder meets the limitation of the saccharide within the instant claims. The dry mix from operation 10 was supplied continuously to the apparatus of Figure

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2, and the introduction of atomized water and saturated steam controlled to produce an average temperature in zone 19 of about 100' F., and to provide aggregates discharging from the equipment - with a moisture content of about 17% (total). This meets the limitation of steam in claim 14. The discharging material was deposited upon the endless belt conveyor 22, which transferred the material to the finish drier. The holding period during transit was about 45 seconds during which time the material became definitely less sticky and more firm. Drying air was supplied to the first drier stage at a temperature of 225' F., and the drying continued in this stage to reduce the moisture content to about 8% (total). Thereafter the material was dried in similar equipment with the inlet temperature at a value of about 250o F., and such drying was continued to produce a final moisture 10 content of 5% (total). The product produced in accordance with this example had the desirable characteristics previously described (see col. 4, lines 1-12). Note that while the reference may not recite the presence of an antibody, the reference uses raw eggs. Raw eggs would naturally contain antibodies and since the whole egg is utilized the antibodies would be present in the mixture. Furthermore, the egg meets the limitation of claim 14 since this claim only calls for a protein and the egg contains protein.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 24-26, 29-35 rejected under 35 U.S.C. 103(a) as being unpatentable over Peebles et al. (US2950204).

The reference teaches a method of making dried egg products that are suitable in cake mixes. The reference specifically teaches that raw egg white was spray dried to form a good edible dry powdered product. This powdered egg white was then mixed with an equal quantity (by weight) of lactose powder. Note that lactose powder meets the limitation of the saccharide within the instant claims. The dry mix from operation 10 was supplied continuously to the apparatus of Figure 2, and the introduction of atomized water and saturated steam controlled to produce an average temperature in zone 19 of about 100° F., and to provide aggregates discharging from the equipment with a moisture content of about 17% (total). This meets the limitation of steam in claim 14. The discharging material was deposited upon the endless belt conveyor 22, which transferred the material to the finish drier. The holding period during transit was about 45 seconds during which time the material became definitely less sticky and more firm. Drying air was supplied to the first drier stage at a temperature of 225° F., and the drying continued in this stage to reduce the moisture content to about 8% (total). Note that this meets the limitation of claim 30. Thereafter the material was dried in similar equipment with the inlet temperature at a value of about 250° F., and such drying was continued to produce a final moisture content of 5% (total). The product produced in accordance with this example had the desirable characteristics previously described (see col. 4, lines 1-12). Note that while the reference may not recite the presence of an antibody, the reference uses raw eggs. Raw eggs would naturally contain antibodies and since the whole egg is utilized the antibodies would be present in the mixture. Furthermore, the egg meets the limitation of claim 14 since this claim only calls for a protein. The difference between the US patent and the instant application is that the reference does not teach method of providing a solid composition prepared

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by mixing egg with at least one saccharide compound to form an egg liquid suspension and drying the suspension.

However, the KSR court concluded that "obvious to try" may be an appropriate test under 103. The Supreme Court stated in *KSR*

When there is motivation

"to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, ___, 82 USPQ2d 1385, 1397 (2007).

Here, the "problem" facing those in the art was to make a mixture of dried egg and lactose, and there were a limited number of methodologies available to do so, for example making dried egg and mixing with dried lactose or making a solution of egg and lactose then subsequently drying them by means of spray drying. The skilled artisan would have had reason to try these methodologies with the reasonable expectation that at least one would be successful. Note that both methods would lead to a dried product containing egg and lactose. Thus, "the product not of innovation but of ordinary skill and common sense," leading one to conclude that the product/process claimed is not patentable as it would have been obvious.

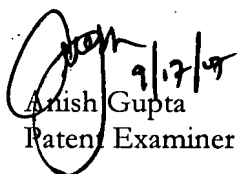
9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the

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THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anish Gupta whose telephone number is (571)272-0965. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang, can normally be reached on (571) 272-0562. The fax phone number of this group is (571)-273-8300.

 9/17/09
Anish Gupta
Patent Examiner